

### **REMARKS**

The above amendments and the following remarks are being submitted as a full and complete response to the Office Action dated January 23, 2009, in conjunction with a Request for Continued Examination (RCE) is being concurrently filed herewith. In view of the above amendments and the following remarks, the Examiner is respectfully requested to give due reconsideration to this application, to indicate the allowability of the claims, and to pass this case to issue.

#### **Status of the Claims**

Claims 1, 3-8 and 10-11 are under consideration in this application. Claims 1, 6, 13 and 17 are being amended to correct formal errors and to more particularly point out and distinctly claim the subject invention. All the amendments to the claims are supported by the specification. Applicants hereby submit that no new matter is being introduced into the application through the submission of this response.

#### **Formality Rejection**

Claims 1 and 13 were objected to for informalities. As indicated, the claims are being amended as required by the Examiner. Accordingly, the withdrawal of the outstanding informality rejection is in order, and is therefore respectfully solicited.

#### **Prior Art Rejection**

Claims 1, 3, 6-8, 10-13 and 15-20 remain rejected under 35 U.S.C. §103 (a) as being unpatentable over Ohba et al. (WO 99/52973; US 6,605,344). This rejection has been carefully considered, but is most respectfully traversed, as more fully discussed below.

The stretched-formed multilayer container of claim 1 is formed by stretching a multilayer sheet or a multilayer preform at an area draw ratio of 1.1 to 100 times, said multilayer sheet or said multilayer preform comprising a layer (a) made of a thermoplastic resin (A) and at least one layer unit of a (bc)/(de) layer unit or a (de)/(bc) layer unit which is arranged on at least one surface of layer (a) with or without an adhesive backing, said (bc)/(de) layer unit or said (de)/(bc) layer unit consisting of a layer (bc) made of a mixture of a polycarboxylic acid-based polymer (B) and a plasticiser (C) and a layer (de) made of a mixture of a bivalent metal compound (D) and a resin (E), said layer (bc) and said layer (de) being adjacent to each other, said layer (bc) being formed without a heating operation that

facilitates esterification between hydroxyl groups of the plasticiser (C) and carboxyl groups of the polycarboxylic acid-based polymer (B), and said multilayer sheet or said multilayer preform containing a bivalent metal compound (D) so that the chemical equivalent of a bivalent metal in the total amount (Dt) of the bivalent metal compound (D) is 0.2 or more relative to the total amount (Bt) of carboxyl groups contained in the layers (bc) and (de).

The invention of claim 13 is also directed to a method of manufacturing the stretched-formed multilayer container of claim 1.

According to the present specification, the multilayer sheet and the multilayer preform according to the present invention are obtained by not employing the heating operation which facilitates esterification of hydroxyl groups of the plasticiser (C) and carboxyl groups of the polycarboxylic acid-based polymer (B) (p. 19, lines 18-25). Specifically, in the present invention, the layer (bc) in the multilayer sheet and the multilayer preform have not been subjected to heat-treatment.

On the other hand, the prior art film described in the background of the present specification is the mixture of a poly (meth) acrylic acid polymer and a polyalcohol polymer which needs to be denatured by a predetermined treatment (e.g., heat treatment) for the gas barrier resin composition or gas barrier film to have sufficient oxygen-gas barrier properties and resistance properties to high-temperature water vapor and hot water, and that molded materials made of the mixture are not stretchable (p. 3, line 17 to p. 4, line 1.)

In Ohba, *“after completion of heat treatment, the resultant polymer layer has water resistance and exhibits excellent gas-barrier properties under high humidity.”* (Col. 9, lines 51-54). *“In order to impart some degree of water-resistance and gas-barrier properties to the polymer layer, at least the polymer layer is preferably subjected to heat treatment* (Col. 3, lines 48-51).” In Ohba, to obtain the polymer layer having a sufficient gas barrier property, the heat treatment is an indispensable process. In fact, all of the gas-barrier films obtained in examples described in Ohba are obtained by employing heat treatment. The composition of the stretched-formed multilayer container of the present invention and the effects achieved by the stretched-formed multilayer container were unknown to and unexpected by Ohba.

Contrary to the Examiner’s assertion (p. 6, lines 6-8; p. 8, 1<sup>st</sup> para. of the outstanding Office Action) that Ohba does not apply a heating step while treating the polycarboxylic acid layer (b/c), Ohba states that the polymer layer having such oxygen permeability is obtained by employing a heat treatment (col. 9, lines 24-41) and Ohba repeatedly emphasizes the importance of such a heat treatment. *“After completion of a heat treatment, the resultant*

*polymer layer has water resistance and exhibits excellent gas-barrier properties under high humidity (col. 9 lines 51-54)". "In the present invention, in order to impart some degree of water-resistance and gas -barrier properties to the polymer layer, at least the polymer layer is preferably subjected to heat treatment (Col. 3 lines 48-51)." In addition, all of the gas-barrier films obtained in examples described in Ohba are obtained by employing a heating step. Considering the whole disclosure of Ohba, it is apparent to one skilled in the art that the heating step is indispensable in order to obtain the polymer layer in Ohba. Therefore, the polycarboxylic acid layer in the film is formed by employing the heat operation in Ohba.*

In response to the Examiner's comments (p. 9, 2<sup>nd</sup> para. of the outstanding Office Action) that the present invention applies heating when stretching a multilayer container, Applicants specify the claims to recite that the present invention eliminates the heating operation that facilitates esterification between hydroxyl groups of the plasticiser (C) and carboxyl groups of the polycarboxylic acid-based polymer (B), which is different from the heating when stretching a multilayer container as explained as follows.

The common heating during stretching a multilayer container is at about 100°C for several tens of seconds (for example, heating at ~100°C for ~10 seconds in pet bottle molding). It is known to one skilled in the art that the common heating can not facilitate esterification of hydroxyl groups of the plasticiser (C) and carboxyl groups of the polycarboxylic acid-based polymer (B). Thus, it is apparent that the term of "the heating operation" in the claim 1 is essentially different from the heating during stretching a multilayer container used in the examples described in the specification.

On the other hand, a heating step employed in Ohba for obtaining the film is a heating step heated at higher temperature or at longer time compared with those in the common heating during the stretching step of the present invention (See all of examples in Ohba). As mentioned above, Ohba's heating conditions are different from the conditions of the common heating during stretching step of the present invention. Ohba's heating conditions clearly facilitate esterification of hydroxyl groups of polyalcohol and carboxyl groups of the polycarboxylic acid-based polymer.

Although Ohba discloses that *"the process for forming a polymer layer from the above-prepared composition is not particularly limited. For example, a "polymer layer" is obtained through any of the following processes: .... a process in which an aqueous solution containing a polymer mixture at high concentration is applied onto a plastic film, and the film is stretched under heating (col. 6, line 27-39)"*, Ohba is silent regarding stretched-

forming the laminate comprising the polymer layer obtained by the process of the present invention.

Ohba also mentions a “stretched nylon film” (e.g., Examples 12-13, col. 14, lines 25-35). For example, *“In order to impart strength or sealability to the gas-barrier film of the present invention, a plastic film may further be laminated on the gas-barrier film, to thereby form a laminated gas-barrier film.... Specific examples of layer structures of laminated gas-barrier film include “stretched nylon layer”/polymer layer/metallic compound layer/non-stretched polypropylene layer, etc. (col. 9, line 62 to col. 10, line 25).”* Ohba is silent regarding stretched-forming the laminate of the present invention.

Moreover, by using the polycarboxylic acid-based polymer (B) with an oxygen permeability coefficient of  $1,000 \text{ cm}^3 (\text{STP}) \cdot \mu\text{m} / (\text{m}^2 \cdot \text{day} \cdot \text{MPa})$  or less at  $30^\circ\text{C}$  and relative humidity of 0% when formed into a film by itself (p. 11, lines 10-17), the present invention provides a stretched-formed multilayer container having an oxygen permeability coefficient **no greater than 200 (or even 100)**  $\text{cm}^3 (\text{STP}) \cdot \mu\text{m} / (\text{m}^2 \cdot \text{day} \cdot \text{MPa})$  or less at  $30^\circ\text{C}$  and relative humidity of 80% (p. 25, lines 15-19). On the other hand, Ohba’s multi-layer laminate has an oxygen transmission rate as high as  $400 \text{ cm}^3/\text{m}^2 \cdot \text{day} \cdot \text{atm}$  (**~3,948**  $\text{cm}^3(\text{STP})/(\text{m}^2 \cdot \text{day} \cdot \text{MPa})$  as measured at  $30^\circ\text{C}$  and 80% RH after 24 hours (col. 9, lines 39-41), which is much worse than the present invention. Such low oxygen permeability coefficients in the present invention were unexpected by Ohba, and will not naturally flow from the teachings of Ohba. Regarding the examiner’s comments (p. 8, last para. of the outstanding Office Action), Applicants apologize that **3.948** should be corrected into **3,948**. One skilled in the art can convert “ $400 \text{ cm}^3/\text{m}^2 \cdot \text{day} \cdot \text{atm}$ ” into “**3,948**  $\text{cm}^3(\text{STP})/(\text{m}^2 \cdot \text{day} \cdot \text{MPa})$ .”

Contrary to the Examiner’s assertion (p. 6, 1<sup>st</sup> para. of the outstanding Office Action), it is NOT obvious to stretch-form Ohba’s laminate. As disclosed in the present specification, the conventional film obtained by employing the heat operation against the mixture of a poly (meth) acrylic acid polymer and a polyalcohol polymer is not stretchable (p. 3, line 17 to p. 4, line 1.) On the other hand, as mentioned above, since Ohba’s gas-barrier films are obtained by employing the heating step to facilitate esterification of hydroxyl groups of polyalcohol and carboxyl groups of the polycarboxylic acid-based polymer, it is intuitive to one skilled in the art to avoid stretch-form Ohba’s laminate. Moreover, Ohba neither discloses nor suggests anything about stretching the gas-barrier film. Further, Ohba does not suggest gas barrier

properties of the film which has been stretched. Since Ohba does not disclose anything about the stretched film, the effects achieved by the stretched-formed container obtained by stretch-forming the film are unknown and unexpected in view of Ohba.

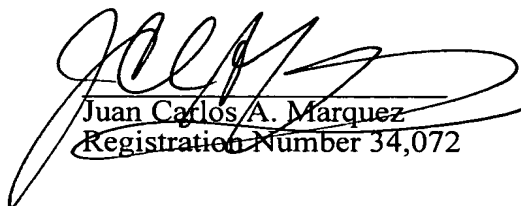
Applicants contend that the cited references and their combinations fail to teach or suggest each and every feature of the present invention as recited in at least independent claims 1 and 13. As such, the present invention as now claimed is distinguishable and thereby allowable over the rejections raised in the Office Action. The withdrawal of the outstanding prior art rejections is in order, and is respectfully solicited.

### Conclusion

In view of all the above, Applicants respectfully submit that certain clear and distinct differences as discussed exist between the present invention as now claimed and the prior art references upon which the rejections in the Office Action rely. These differences are more than sufficient that the present invention as now claimed would not have been anticipated nor rendered obvious given the prior art. Rather, the present invention as a whole is distinguishable, and thereby allowable over the prior art.

Favorable reconsideration of this application as amended is respectfully solicited. Should there be any outstanding issues requiring discussion that would further the prosecution and allowance of the above-captioned application, the Examiner is invited to contact the Applicants' undersigned representative at the address and telephone number indicated below.

Respectfully submitted,



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